DRAFT

San Jacinto River: EPA Modeling Workshop #1

Model Structure, Development and Calibration Strategy

- Review modeling objectives
- Overview of model structure
 - o Hydrodynamic model
 - EFDC → general capabilities
 - 2-D vertically-averaged mode
 - o Sediment transport model
 - SEDZLJ → general capabilities
 - Cohesive and non-cohesive suspended load transport
 - o Chemical fate and transport model
 - QEAFATE → general capabilities
 - o Linkages between 3 models
 - o Application to other sites
- Hydrodynamic model
 - o Numerical grid and model domain
 - o Bathymetry and geometry
 - Boundary conditions
 - Upstream inflow at Lake Houston Dam
 - Water surface elevation at downstream boundary
 - o Calibration strategy
 - Use ADCP data collected during 2010 and 2011
- Sediment transport model
 - o Review of model structure/theory
 - Cohesive bed → SEDZLJ
 - Non-cohesive bed → van Rijn suspended load transport
 - Sediment properties
 - 4 size classes
 - o Bed properties
 - Delineation of cohesive and non-cohesive bed areas
 - Spatial distribution of bulk bed properties
 - Initial conditions for composition
 - Dry density
 - D50 (non-cohesive bed)

- Erosion rate parameters for cohesive bed
 - o Analysis of Sedflume data
- o Incoming sediment load at upstream boundary
 - Magnitude → rating curve based on analysis of USGS data
 - Composition → analysis of USGS data
- o Calibration strategy
 - Primary calibration target: NSR
 - Analysis of radioisotope cores to estimate NSR
 - Secondary calibration target: TSS concentration
 - Low-flow data collected at ISCO
 - Discuss inputs and parameters to adjust during calibration
- Chemical fate and transport model
 - o Review of model structure/theory
 - Selection of chemicals to simulate
 - Initial conditions
 - Spatial distribution of chemical bed concentrations
 - o Boundary conditions
 - Chemical concentrations at upstream and downstream boundaries
 - Point and non-point loads
 - o Simulation of Partitioning
 - o Specification of key chemical fate and transport parameters
 - Organic carbon
 - Mass transfer processes in sediment bed
 - Other parameters (water temperature, volatilization, etc.)
 - Calibration strategy
 - Key calibration targets: spatial and temporal patterns in sediment and water column data
 - Discuss inputs and parameters to adjust during calibration
- Analysis of relationships between biota, sediment, and water column